Claims

1. A polymeric compound composed of linear polymer chains having the general formula

$$-[R-X]_n-$$

in which R is a hydrocarbon group, and X is a group having at least one heteroatom, where the linear polymer chains are crosslinked together via linking groups.

2. The polymeric compound as claimed in claim 1, characterized in that it is a substantially insoluble, swellable resin.

3. The polymeric compound as claimed in claim 1 or 2, characterized in that the linking groups crosslink the linear polymer chains via their heteroatoms.

4. The polymeric compound as claimed in any of the preceding claims, characterized in that only some, preferably less than 30%, more preferably less than 15%, in particular about 12%, of the heteroatoms are connected to linking groups, and most of the remaining heteroatoms are available for further derivatizations.

5. The polymeric compound as claimed in any of the preceding claims, characterized in that R is an alkyl group, preferably a C_1-C_6-alkyl group, in particular a linear alkyl group.

6. The polymeric compound as claimed in any of the preceding claims, characterized in that R is an ethylene group.

7. The polymeric compound as claimed in any of the preceding claims, characterized in that X is selected from the group consisting of NH, N-R^1, CH-NH_2, CH-OH, CH-R^2-OH, in particular NH, in which R^1 and R^2 are selected from the group consisting of alkyl, cycloalkyl, aryl and benzyl.

8. The polymeric compound as claimed in any of claims 1 to 6, characterized in that X is selected from the group consisting of N^+-R^1R^2, O, S, CH-R^2-NH_2, CH-SH, CH-R^2-SH, in which R^1 and R^2 are selected from the group consisting of alkyl, cycloalkyl, aryl and benzyl.

9. The polymeric compound as claimed in either of claims 7 or 8, characterized in that R^2 is a C_1-C_6-alkyl group, preferably a methylene group.

10. The polymeric compound as claimed in any of the preceding claims, characterized in that the polymer chains are polyethyleneimine chains.

11. The polymeric compound as claimed in any of claims 1 to 9, characterized in that the polymer chains are polyvinylamine chains.

12. The polymeric compound as claimed in any of the preceding claims, characterized in that the linking groups are derived from at least one compound selected from the group consisting of polyaldehydes, activated polycarboxylic acids, isocyanates, isothiocyanates, dihalides, epoxides, ketenes and epichlorohydrin.

13. The polymeric compound as claimed in claim 12, characterized in that the linking groups are derived from at least one polyaldehyde, preferably from at least one aromatic polyaldehyde.

14. The polymeric compound as claimed in any of the preceding claims, characterized in that the linking groups are derived from a dialdehyde, preferably from an aromatic dialdehyde, in particular from terephthalaldehyde.

15. The polymeric compound as claimed in any of the preceding claims, characterized in that it is composed of linear polyethyleneimine crosslinked with terephthalaldehyde.

16. The polymeric compound as claimed in claim 12, characterized in that the linking groups are derived from at least one dihalide, preferably from a dihalide of the group 1,4-dibromomethylbenzene, 1,4-dichloromethylbenzene, 1,6-dibromo(dichloro)hexane, and 1,7-dibromo(dichloro)heptane.

17. The polymeric compound as claimed in any of the preceding claims, characterized in that it has a loading with amino functionalities of about 10 to about 25 mmol/g, preferably about 15 mmol/g.

18. The polymeric compound as claimed in any of the preceding claims, characterized in that it is in the form of resin micropellets.

19. The use of a polymeric compound as claimed in any of the preceding claims for solid phase synthesis.

20. The use as claimed in claim 19 for synthesizing peptides and proteins.

21. The use as claimed in claim 19 for synthesizing heterocycles.

22. The use of a polymeric compound as claimed in any of claims 1 to 18 for polymer-assisted synthesis in solution.

23. The use as claimed in claim 22 for preparing polymeric reagents.

24. The use as claimed in claim 22 for preparing an ion exchanger.

25. The use of a polymeric compound as claimed in any of claims 1 to 18 for immobilizing enzymes.

26. The use of a polymeric compound as claimed in any of claims 1 to 18 for immobilizing substrates which are converted with an enzyme.

27. The use of a polymeric compound as claimed in any of claims 1 to 18 as carrier for pharmacological active ingredients.

28. The use of a polymeric compound as claimed in any of claims 1 to 18 for inducing an immune response.

29. The use of a polymeric compound as claimed in any of claims 1 to 18 as scavenger of electrophiles, in particular of acid chlorides and isocyanates.

30. A method for solid phase synthesis, characterized in that a polymeric compound as claimed in any of claims 1 to 18 is provided with a suitable linker, and then the compound to be synthesized is assembled stepwise on this linker.